

ILLUSTRATED CHECKLIST OF OPISTHOBRANCH FAUNA OF RATNAGIRI, MAHARASHTRA, INDIA, WITH EIGHT NEW RECORDS TO INDIA

VISHAL BHAVE^{1,2} AND DEEPAK APTE^{1,3}¹Bombay Natural History Society, Hornbill House, Shaheed Bhagat Singh Road, Mumbai 400 001, Maharashtra, India.²Email: vishalbhav@gmail.com³Email: spiderconch@gmail.com

The Ratnagiri coast is among the least studied areas for marine life in India. The coast is known to host a high diversity of marine habitats, and flora and fauna. Opisthobranchs have received attention only recently, Maharashtra coast being the least explored. The paper presents 16 species of opisthobranch of which 15 are new records to Maharashtra and 8 to India.

Keywords: Nudibranchs, Konkan, Aeolid, Dorid, Sacoglossa, intertidal

INTRODUCTION

Studies on the Opisthobranch fauna of Maharashtra are limited to a few publications by Balani and Patel (1994); Hornell (1909, 1951); Kasinathan *et al.* (1975) and Winckworth (1946a,b). On the west coast of India, most of the work on Opisthobranch is confined to the Gulf of Kutch and Lakshadweep. It includes work by Apte (2009); Apte *et al.* (2010); Apte and Salahuddin (2010); Balani and Patel (1994); Fontana *et al.* (2001); Gideon *et al.* (1957); Hornell (1909, 1951); Jagtap *et al.* (2009); Menon *et al.* (1970); Narayanan (1968, 1969, 1971a,b); Patil (1952); Rudman (1980); and Valdés *et al.* (1999). The present study was carried out in Ratnagiri, Maharashtra, India.

STUDY AREA

Ratnagiri is located at 16.98° N and 73.3° E on the west coast of India, Arabian Sea (Fig. 1). Patchy reefs are present near Ratnagiri in intertidal areas and occasionally at sub-tidal depths. Sampling was mostly done in rocky areas with a few sandy patches.

The intertidal area is rich in alga like *Caulerpa racemosa*, *C. peltata*, *C. taxifolia*, *Sargassum* sp., *Dictyota* sp., *Padina* sp., *Ulva* sp., *Avrainvillea* sp., etc. Many types of cnidarians (anemone, hydroids, corals and soft coral), bryozoan species of genus *Membranipora* and *Electra* are more common. Also, many species of sponges and other associated invertebrates, like nemertean worm and flatworms could be observed.

METHODOLOGY

Opisthobranchs were searched during low tides and a few specimens were collected for reference. The reference specimens were preserved in ethyl alcohol after studying the morphological characters in live condition. Digital images

of live specimens of each species were taken to record true colours. Wherever possible, notes on egg cases were made. Specimens were deposited in the Collection of the Bombay Natural History Society. Field collection was carried out from November 2008 to March 2009.

RESULTS AND DISCUSSION

During the five month study a total of 16 species were recorded belonging to 12 families. Of these, 15 species are new records to Maharashtra and 8 to the Indian coast. Table 1 summarizes the findings. This indicates that the opisthobranch fauna in India, particularly in Maharashtra, is the least studied. A comprehensive assessment is thus necessary to reveal the true diversity of this group. The Ratnagiri coast with its excellent rocky shores and abundant variety of algae, sponges and hydroids, provides an ideal habitat for opisthobranch fauna. Shallow rock pools provide highly specialized niche for shade loving hydroids. Thus, at certain locations, hydroid affiliated aeolids, e.g., *Phidiana militaris*, *Phidiana anulifera* and *Anteaeolidiella indica* are present in abundance. Sponge feeding *Sebadoris fragilis* and *Dendrodoris fumata* are also present in abundance.

Family: Aplysiidae

Aplysia oculifera Adams & Reeve 1850

India: This is the first record of this species from India.

Extralimital Distribution: Indo-West Pacific, South Africa, Sri Lanka, Red Sea.

Size: 60 & 80 mm (Two specimens).

Description: A large animal usually seen in congregations; mostly seen in shallow waters during receding tides in algal masses. It is greenish-brown with small brown spots. Inner side of mantle is spotted with white (Fig. 2).

Egg mass: The noodle-shaped egg ribbon is greenish-brown.

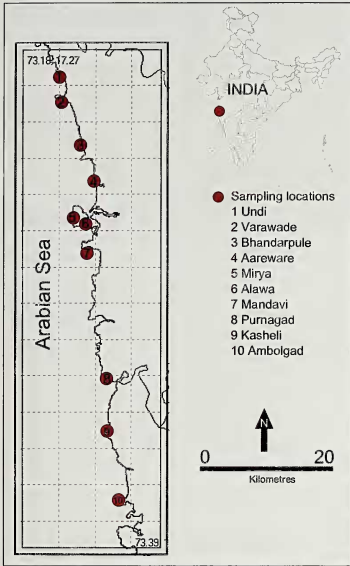


Fig. 1: Sampling sites at Ratnagiri, Maharashtra, India.
(coordinates: 73.18, 17.27; 73.39, 16.57)



Fig. 2: *Aplysia oculifera*

Occurrence: Seasonal, particularly from December through April.

Family: Plakobranchidae

Elysia expansa (O'Donoghue 1924)

India: Ratnagiri.

Extralimital Distribution: South Africa, Indo-West Pacific.

Size: 12-60 mm (37 specimens).

Description: Usually found on *Caulerpa* beds, this species is characterized by large green parapodia. It is deep green to pale yellow, depending upon its feeding state. The parapodium is margined by a black line. Rhinophores are pale brown and tubular (Fig. 3).

Radula: Radular blade is knife-like and flat. Total numbers of teeth are 16 (Figs. 3.2, 3.3).

Table 1: Opisthobranch fauna of Ratnagiri

Sr. No	Family	Species	New Record to Maharashtra	New Record to India
1.	Aplysiidae	<i>Aplysia oculifera</i> Adams & Reeve, 1850	v	v
2.	Plakobranchidae	<i>Elysia expansa</i> (O'Donoghue, 1924)	v	-
3.	Polyceridae	<i>Thecacera pennigera</i> (Montagu, 1815)	v	v
4.	Polyceridae	<i>Plocamopherus ceylonicus</i> (Kelaart, 1858)	v	-
5.	Chromodorididae	<i>Chromodoris naiki</i> Vaidés, Ernesto & Ortea 1999	v	-
6.	Discodorididae	<i>Sebadoris fragilis</i> (Alder & Hancock, 1864)	v	-
7.	Discodorididae	<i>Carminodoris</i> sp.	v	v
8.	Dendrodorididae	<i>Dendrodoris fumata</i> (Rüppell & Leuckart, 1831)	v	-
9.	Bornellidae	<i>Bornella stellifer</i> (Adams & Reeve, 1848)	v	-
10.	Tritoniidae	<i>Marionia cf. olivacea</i>	v	v
11.	Eubranchidae	<i>Eubranchus mandapamensis</i> Rao, 1968	v	-
12.	Eubranchidae	<i>Eubranchus</i> sp.	v	v
13.	Facelinidae	<i>Phidiana militaris</i> (Alder & Hancock, 1864)	-	-
14.	Facelinidae	<i>Phidiana anulifera</i> (Baba, 1949)	v	v
15.	Aeolidiidae	<i>Anteaeolidiella indica</i> (Bergh, 1888)	v	v
16.	Costasiellidae	<i>Costasiella cf. kuroshimae</i>	v	v
			15	8



Fig. 3: *Elysia expansa*

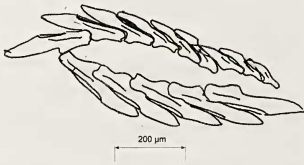


Fig. 3.2: *Elysia expansa*: Radula

Egg mass: The extracellular yolk embedded within the transparent eggs make the egg mass appear like a yellow coil. Egg masses are usually laid on various substrata, e.g., fronds of *Caulerpa* and other green algae, and sometimes on walls of rock pools (Fig. 3.1).

Occurrence: Seasonally common (between November through March).

***Plocamopherus ceylonicus* (Kelaart 1858)**

India: Ratnagiri, Alibaug (Maharashtra), South Gujarat, Gulf of Mannar (Tamil Nadu).

Extralimital Distribution: Australia, Singapore, Philippines, Indonesia, Marshall Island.



Fig. 4: *Plocamopherus ceylonicus*



Fig. 3.1: *Elysia expansa*: Egg case on *Caulerpa scalpelliformis*

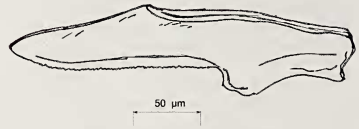


Fig. 3.3: *Elysia expansa*: Single radular tooth

Size: 6-36 mm (Seven specimens, one dissected for radula).

Description: These slugs are found under rocks. Head bears an oral veil, a dermal process protruding from the anterior part of the head. There are 3 pairs of papillae on either side of the body; the 2nd pair from the gill has pink rounded knobs (Fig. 4), which are known to emit light when disturbed. We have seen this behaviour in the specimens collected from Mumbai and Gulf of Kutch, but not in the specimens from Ratnagiri. Foot and mantle bear bright orangish-yellow spots. Foot is extended to form a tapering tail, which is used for swimming when disturbed.



Fig. 4.1: *Plocamopherus ceylonicus*: Egg case

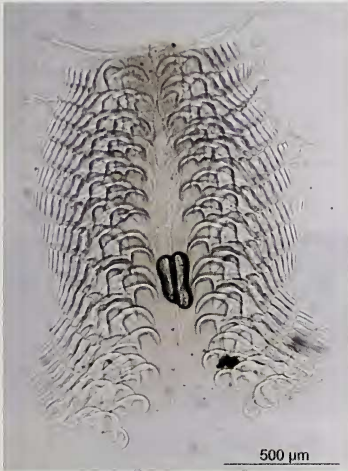


Fig. 4.2: *Plocamopherus ceylonicus*: Radula

Radula: Radular formula: 13 x 7.3.0.3.7 (Figs. 4.2, 4.3).

Egg mass: Egg case is a yellow rosette, with large yellow eggs embedded in the gelatinous sheath (Fig. 4.1).

Occurrence: Seasonally common (between October through April).

Family: Polyceridae

Thecacera pennigera (Montagu 1815)

India: This is the first record of this species from India.

Extralimital Distribution: A widely distributed species, it is recorded from British Isles, Australia, Korea, Japan, New Zealand, Netherlands, Senegal, Israel, Pakistan, West Africa, Brazil, South Africa (NIMPIS 2002).

Size: 8-18 mm (Five specimens).

Description: A small sea slug, the foot is short, yellow, and spotted with tiny orange and black spots. Body appears speckled with white dots/rodlets. Broad head has two pointed lateral extensions. Rhinophores are contained within the flared rhinophore sheaths – a diagnostic feature of the species. The rhinophore sheath and gills are covered by orange and black spots (Fig. 5).

Egg mass: The white ribbon-like egg case is laid on bryozoans, the main food source of the species. The ribbon is about 0.8 cm wide (Fig. 5).



Fig. 4.3. *Plocamopherus ceylonicus*: Radula (right half side)

Occurrence: Uncommon and seasonal (between December through April).

Family: Chromodorididae

Chromodoris naiki Valdés, Ernesto and Ortea 1999

India: This is the first record from Ratnagiri. The species was described from the Gulf of Mannar (Valdés *et al.* 1999).

Extralimital Distribution: Thailand.

Size: 3-16 mm (Three specimens).

Description: A tiny sea slug from rocky reefs, the base colour is white with a highly decorated surface. Margin is deep orange lined by a row of deep purple spots. Dorsal surface is profusely speckled with silver spots. Rhinophores, foot and gills are also speckled with silver spots. Foot is short and white in colour. It differs from *C. naiki* in: specimen from Ratnagiri has 7 gills (as against 6 in *C. naiki*); orange spots mostly confined to a sub-marginal mantle band. We are



Fig. 5: *Thecacera pennigera* with egg case

currently considering it as a regional variation of *C. naiki* (Fig. 6).

Another similar species – *Chromodoris bombayana* Winkworth 1946 – is described from much closer to the current locality. *Chromodoris bombayana* has black spots and white speckles; speckles are clearly seen in both the specimens from Ratnagiri as well as the specimen described by Valdes *et al.* (1999). However, we have identified the specimen as *Chromodoris naiki* till we collect adequate specimens for anatomical studies, as well as specimens of *C. bombayana* from the type locality.



Fig. 6: *Chromodoris naiki*

Occurrence: Uncommon.

Family: Discodorididae

Sebadoris fragilis (Alder and Hancock 1964)

India: Ratnagiri (Maharashtra), Gulf of Mannar (Tamil Nadu), Waltair (Andhra Pradesh).

Extralimital Distribution: Indian Ocean, Australia, Philippines, Red Sea, Japan, South Africa, Thailand, Hawaii, New Caledonia.

Size: 15-80 mm (12 specimens).

Description: A large sea slug, it is usually seen in



Fig. 7: *Sebadoris fragilis* (Dorsal side)



Fig. 7.1: *Sebadoris fragilis* (Ventral side)



Fig. 7.2: *Sebadoris fragilis*: Egg case

shallow pools and under rocks. It prefers rocky substrate. Brown mottling is distinct on the foot (Fig. 7.1). The species can autotomise large parts of the mantle or sometimes the entire mantle skirt if disturbed. Gills are highly frilled (Fig. 7). The species was re-designated as *S. fragalis* by Dayrat (2010) in his comprehensive review of basal discodorids.

Egg mass: The yellow egg mass is a rosette. Egg ribbon is around 40 mm in diameter in larger specimens (Fig. 7.2).

Occurrence: Common (from November through April).

Carminodoris sp.

India: Ratnagiri (Maharashtra).

Extralimital Distribution: Unknown.

Size: 70-80 mm (Two specimens).

Description: A large ovate sea slug, usually seen under rocks. Mantle is covered with rounded tubercles of varying sizes. The ground colour is translucent brown with scattered dark brown patches. Tubercles are somewhat brownish with white basal band. The species has a close resemblance with *Carminodoris grandiflora* (Fig. 8).

Egg mass: Egg case is a yellowish-cream wavy ribbon around 33 mm in diameter (Fig. 8.1).

Occurrence: Uncommon.



Fig. 8. *Carminodoris* sp.



Fig. 8.1: *Carminodoris* sp.: Egg case

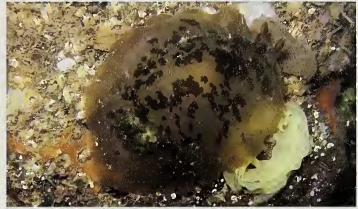


Fig. 9: *Dendrodoris fumata* with egg case

Family: Dendrodorididae

Dendrodoris fumata (Rüppell & Leuckart 1831)

India: Ratnagiri, Andaman, Gulf of Kutch.

Extralimital Distribution: Red Sea, Western Australia, Korea, New Caledonia, Seychelles, Reunion, Singapore, Japan.

Size: 8-60 mm (17 specimens).

Description: It is found mostly in shallow pools and under rocks on muddy reefs. Rhinophores have white tips. Gills are tri-pinnate. This species has a number of colour morphs: a) pale brown to deep orange in specimens around 8-20 mm; b) pale brown with patches of dark brown or vice versa in specimens around 20-40 mm; and c) pale brown with dark brown or blackish patches in specimens around 40-60 mm (Fig. 9).

Egg mass: The yellow egg case is a rosette (Fig. 9).

Occurrence: Seasonally common (from August through May).

Family: Bornellidae

Bornella stellifer (Adams and Reeve 1848)

India: Ratnagiri and Revdanda (Maharashtra), Gulf of Kutch (Gujarat).

Extralimital Distribution: Indo-West Pacific: South China Sea, Australia, Korea, Indian Ocean, South Africa, East Africa, Philippines, Arafura Sea, China Sea, Japan, Hong Kong, Tahiti, New Caledonia, Taiwan, Thailand, Marshall Islands and Papua New Guinea (Pola *et al.* 2009).

Size: 25-40 mm (12 specimens).

Description: A small sea slug, it is found on rocky reefs. Oral tentacles are paired and fingerlike. Gills are placed at the base of each cerata. Each rhinophore is present on a long stalk and surrounded by long filamentous papillae. This slug is deep reddish-brown with white patches, tips of cerata and papillae have a red band. It feeds on hydroids. Specimens from Ratnagiri appear distinct, particularly the cerata, as



Fig. 10. *Bornella stellifer* with egg case



Fig. 11. *Marionia cf. olivacea* on *Carijoa* sp.

Family: Tritoniidae

Marionia cf. olivacea

India: Ratnagiri. This is the first record from India.

Extralimital Distribution: Indonesia, Kenya, Japan.

Size: 30-35 mm (2 specimens).

Description: Body translucent cream with dark orangish-brown pattern on the mantle. The sides of the body are pustulose with a network of orange and creamish-brown colour running between the pustules. The mantle and oral veil are essentially orange-brown with a symmetrical pattern of dark brown patches along the edge of the mantle and at the base of the gills. It was seen in a rock pool with soft coral *Carijoa* sp. (Fig. 11).

Occurrence: Occasional.

Family: Eubranchiidae

***Eubranchus mandapamensis* Rao 1968**

India: Mandapam, Ratnagiri (Maharashtra).

Extralimital Distribution: Indo-Pacific. Hawaii, Mexico.

Size: 10-15 mm (Two specimens).

Description: This aeolid has a transparent body with minute black spots speckled all over. Rhinophores are annulated with about 6-8 annuli. The cerata are larger than the body size and have two tiers of tubercles and a bulbous tip. Tips are whitish followed by three rings coloured orange, yellow, and pink respectively (Fig. 12).

Egg mass: White coloured coiled egg mass (Fig. 12).

Occurrence: Occasional.

***Eubranchus* sp.**

India: Ratnagiri (Maharashtra).

Extralimital Distribution: Not known.

Size: 1-35 mm (11 specimens).

Description: It has a transparent body with minute dark

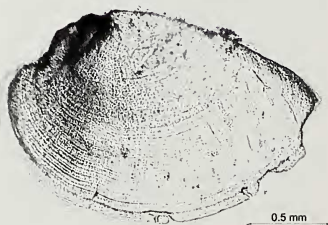


Fig. 10.1: *Bornella stellifer*. Jaw plate

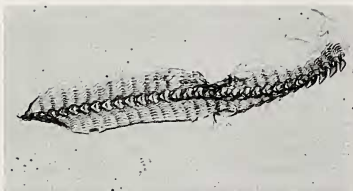


Fig. 10.2: *Bornella stellifer*. Radula

compared to specimens from Gujarat. Anatomically, however, they are the same (Fig. 10).

Egg mass: Egg mass is yellow (in daylight), with secondary coiling, and laid spirally, anti-clockwise from the centre of origin (Fig. 10).

Jaw plate: The jaw is round/oval-shaped (Fig. 10.1).

Radula: Radula formula is 34 x 8.1.8 (Fig. 10.2).

Occurrence: Common (between November through April).



Fig. 12: *Eubranchus mandaparnensis* with egg case

yellowish-orange spots all over, except oral tentacles and rhinophores. Tips of oral tentacles and rhinophores are transparent with a pale yellow-orange band at sub-apical region. Cerata are slender and contain unbranched digestive gland (Fig. 13).

Egg mass: Egg mass is transparent, ribbon-like, 5 mm or less in height arranged in a single spiral, with large white eggs (Fig. 13). Usually seen on the underside of rocks with tiny hydroids (possibly from family Sertulariidae), on which the slug was observed to feed (Fig. 13).

Radula: Formula is 1.1.1 Median teeth with 3-4 lateral denticles on both sides. Median denticle somewhat blunt (Figs. 13.1, 13.2).

Occurrence: Uncommon (between December to March).

Family: Facelinidae

***Phidiana militaris* (Alder & Hancock 1864)**

India: Widespread on the east and west coast of India. Gujarat, Maharashtra, Tamil Nadu, Andhra Pradesh, Andaman.

Extralimital Distribution: Malaysia, Papua New Guinea, Indo-West Pacific.

Size: 11-35 mm (18 specimens).

Description: These sea slugs are closely associated with hydroids. Cerata are transparent and digestive gland bright violet and orange. Oral tentacles and rhinophores bear a distinct Y-shaped orange band (Fig. 14).

Egg mass: White egg mass is laid spirally, usually around 20-28 mm in diameter depending upon the size of the specimen (Fig. 14).

Occurrence: Common (from October through May).

***Phidiana anulifera* (Baba 1949)**

India: Ratnagiri (Maharashtra). It is the first record from India.

Extralimital Distribution: Malaysia, Papua New Guinea.

Size: 5-36 mm (17 specimens).

Description: A small sea slug, the body is opaque white.

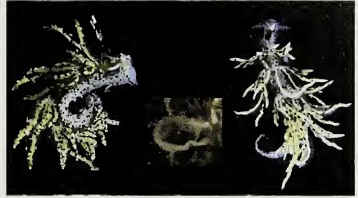


Fig. 13: *Eubranchus* sp.

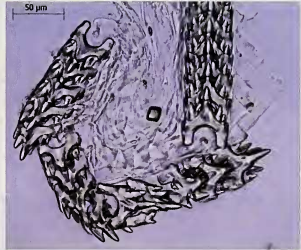


Fig. 13.1: *Eubranchus* sp.: Microphotograph of Radula

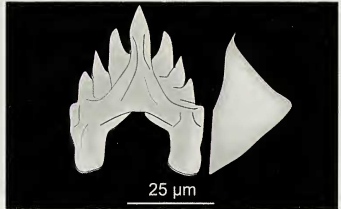


Fig. 13.2: *Eubranchus* sp.: Radula teeth



Fig. 14: *Phidiana militaris* with egg case

Oral tentacles bear a broad reddish-orange band. The rhinophores have six distinct and sharply-edged annuli, annulated region being opaque. There is a pair of thin orange lines running from the base of the oral tentacles back to the rhinophores. These lines continue to run around the back of the rhinophores and down to the first ceratal group on each side. This red-orange line reappears along the side of the body between each ceratal cluster. It also runs a short distance from the last ceratal cluster back on to the posterior foot. The cerata are pale brown primarily due to the colour of the digestive gland (Fig. 15).



Fig. 15.3: *Phidiana anulifera*: Side view



Fig. 15: *Phidiana anulifera*: (L-R): Front view and body profile, Side view



Fig. 15.4: *Phidiana anulifera*: Dorsal view of teeth



Fig. 15.1: *Phidiana anulifera*: Egg case

Egg mass: Egg case is white, laid in spiral with size around 6-12 mm, on or beneath the rock (Fig. 15.1).

Jaw and Radular Formula: Jaw plate rounded with serrated masticatory border (Fig. 15.2) and uni-seriate radula with 21 rows and a rachidean tooth (21-23 x 0.1.0). Each tooth has 4 denticles on each side of a median cusp. (Figs. 15.3, 15.4).

Occurrence: Common (from November through April).

Family: Aeolidiidae

Anteaeolidiella indica (Bergh 1888)

India: Ratnagiri. It is the first record from India.

Extralimital Distribution: It is widely distributed all around temperate, Indian and Pacific Oceans, Red Sea and Canary Islands, Eastern Atlantic.

Size: 6-36 mm (34 specimens).

Description: Rhinophores are smooth, finger-shaped, with white tips. Oral tentacles slightly longer than the



Fig. 15.2: *Phidiana anulifera*: Jaw plate



Fig. 16. *Anteaeolidiella indica* with egg ribbon



Fig. 17. *Costasiella cf kuroshimae* with egg case

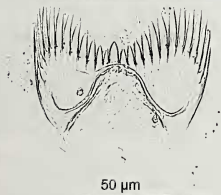


Fig. 16.1 *Anteaeolidiella indica*: Radular tooth

50 μ m

rhinophores. The orange pattern that outlines the white diamond-shaped marks on the dorsa is characteristic (Fig. 16).

Egg mass: Egg case is spirally coiled and white (Fig. 16).

Radula: Radular formula is 8 x 0.1.0; denticles of radular teeth vary between 7 and 12 in the 6 mm specimen. Radula looks similar to that of *Anteaeolidiella orientalis* (Bergh 1888), now a synonym of *Anteaeolidiella indica* (Bergh 1888) Gosliner and Griffiths (1981) (Fig. 16.1).

Occurrence: Common (between October through May).

Family: Costasiellidae

Costasiella cf kuroshimae

India: Ratnagiri.

Size: 18 and 25 mm (Two specimens).

Description: An orange-brown band on the head and between the rhinophores is diagnostic. A pair of eyes situated on the dorsal midline is characteristic of the genus. Many cerata-like structures are densely arranged on either side of the body giving it a look of an aeolid. Cerata-like structures are pinkish at the tip, translucent and greenish due to cell sap and chloroplast. The species from this genus are known to feed exclusively on green algae *Avrainvillea* sp.

Egg mass: Egg cases are spiral, white and laid on *Avrainvillea* sp. (Fig. 17).

Occurrence: Uncommon.

ACKNOWLEDGEMENTS

We take this opportunity to express our sincere thanks to Dr. Bill Rudman who helped us identify a few species. We also acknowledge Rahul Aathaley for accompanying us on the field trips. Vishwas Shinde and Rajendra Pawar provided valuable support in the field work and found many species. Dr. Asad R. Rahmani, Director, Bombay Natural History Society for his continued supportive.

Our special thanks to Ms. Pooja Nagale and Ms. Amruta Prasade for preparing the radula of some species illustrated in the present communication.

REFERENCES

APTE, D.A. (2009): Opisthobranch fauna of Lakshadweep Islands, India with 52 new records to Lakshadweep and 40 new records to India. Part 1. *J. Bombay Nat. Hist. Soc.* 106(2): 162-175.

APTE, D.A., V.J. BHAVE & D. PARASHARYA (2010): An Annotated and illustrated Checklist of the Opisthobranch fauna of Gulf of Kutch, Gujarat, India, with 20 new records for Gujarat and 14 new records for India. Part 1. *J. Bombay Nat. Hist. Soc.* 107(1): 14-23.

APTE, D.A. & V.K. SALAHUDDIN (2010): Record of *Hexabranchius sanguineus* (Rüppell & Leuckart 1828) from Lakshadweep Archipelago, India. *J. Bombay Nat. Hist. Soc.* 107(3): 261-262.

BALANI, M.C. & B. PATEL (1994): Occurrence of *Elysia grandifolia* (Mollusca, Gastropoda), and its radionuclide content from Tarapur Coastal Waters, West Coast of India. *Indian Journal of Marine Sciences* 23(1): 61-63.

DAYRAT, B. (2010): A monographic revision of basal Discodorid sea slugs (Mollusca: Gastropoda: Nudibranchia : Doridina). *Proc. Calif. Acad. Sci.* 61 (supplement 1): 1- 403.

FONTANA, A., M.L. CIAVATTA, L. D'SOUZA, E. MOLLO & C.G. NAIK (2001): Selected chemo-ecological studies of marine opisthobranchs from Indian coasts. *J. Indian Inst. Sci.* 81: 403-415.

- GIDEON, P.W., P.K.B. MENON, S.R.V. RAO & K.V. JOSE (1957): On the marine fauna of the Gulf of Kutch: A preliminary survey. *J. Bombay Nat. Hist. Soc.* 54(3): 690-706. pl. 1.
- GOSLINER, T.M. & R.J. GRIFFITHS (1981): Description and revision of some South African aeolidacean Nudibranchia (Mollusca, Gastropoda). *Annals of the South African Museum*, 84(2): 105-150.
- HORNELL, J. (1909): A note on the presence of symbiotic algae in the integuments of nudibranchs of the genus *Melibe*. pp. 145-148. In: Hornell, J. (Ed.): Report to the government of Baroda on the marine zoology of Okhamandal, 1.
- HORNELL, J. (1951): Indian molluscs. Bombay Natural History Society. Pp. 41-42.
- JAGTAP, T.G., P.S. SHENAI-TIRODKAR, S.B. SAVANT, V.A. KULKARNI & Z.A. ANSARI (2009): *Elysia bangtawaensis* Swennen (Nudibranch) from the mangrove habitat of Mandovi estuary, Goa (Central west coast), India. *Current Science* 96(1): 30-33.
- KASINATHAN, R., K. GOVINDAN & B.N. DESAI (1975): On the Opisthobranch *Haminoea vitrea* (A. Adams, 1850) From Madh Island (Bombay). *Journal of the Marine Biological Association of India* 17(3): 696-701.
- MENON, P.K.B., A.K. DUTTA & D. DAS GUPTA (1970): On the marine fauna of the Gulf of Kutch. Part II. *J. Bombay Nat. Hist. Soc.* 58(2): 475-494, pl. 1-10.
- NARAYANAN, K.R. (1968): On three opisthobranchs from the south-west coast of India. *Journal of the Marine Biological Association of India* 10(2): 377-380; Fig. 1-2.
- NARAYANAN, K.R. (1969): On the opisthobranchiate fauna of the Gulf of Kutch. Proceedings of the Symposium on Mollusca held at Cochín from January 12 to 16, 1968. Symposium Series 3, pt. 1, pp. 189-213. Marine Biological Association of India, Mandapam Camp, India.
- NARAYANAN, K.R. (1971a): On two doridacean nudibranchs (Mollusca: Gastropoda), from the Gulf of Kutch, new to the Indian coast. *J. Bombay Nat. Hist. Soc.* 68(1): 280-281.
- NARAYANAN, K.R. (1971b): On a species of the genus *Berthellina* (Opisthobranchia: Notaspidea) of the Gulf of Kutch. *Journal of the Marine Biological Association of India* 12 (1-2): 210-212.
- NIMPIS. (2002): *Thecacera pennigera* species summary. National Introduced Marine Pest Information System. In: Hewitt, C.L., R.B. Martin, C. Sliwa, F.R. McEnulty, N.E. Murphy, T. Jones and S. Cooper (Eds): Web publication available online at <http://crimp.marine.csiro.au/nimpis>.
- PATIL, A.M. (1952): Study of the marine fauna of the Karwar coast & neighbouring islands. III Mollusca, Scaphopoda, Pelecypoda, Cephalopoda. *J. Bombay Nat. Hist. Soc.* 51: 29-41.
- POLA, M., W.B. RUDMAN & T.M. GOSLINER (2009): Systematics and preliminary phylogeny of Bornellidae (Mollusca: Nudibranchia: Dendronotina) based on morphological characters with description of four new species. *Zootaxa* 1975: 1-57.
- RUDMAN, W.B. (1980): Aeolid opisthobranch molluscs (Glaucidae) from the Indian Ocean and the south-west Pacific. *Zoological Journal of the Linnean Society* 68(2): 139-172.
- VALDES, A., M. ERNESTO & J. ORTEGA (1999): Two new species of *Chromodoris* (Mollusca, Nudibranchia, Chromodorididae) from southern India, with a re-description of *Chromodoris trimarginata* (Winckworth, 1946). *Proceedings of the California Academy of Sciences* 51(13): 461-447.
- WINCKWORTH, H.C. (1946a): *Glossodoris* from Bombay. *Proceedings of the Malacological Society of London* 26(6): 155-160.
- WINCKWORTH, H.C. (1946b): A new *Goniodoris* from Bombay. *Journal of Molluscan Studies, Malacological Society of London* 27(2): 59-61.

Photographs: Vishal Bhawe.

Deepak Apte: *Dendrodoris fumata* and *Sebadoris fragilis* egg case.

